

over ninety days in all, the "glare" was of *constant occurrence*. By the arrival of O.S.S. *Mariposa* from San Francisco, December 1 to 8, I am happily able also to trace a continuous line of these phenomena hence to that point. They were not observed there until about November 23. Two of our leading citizens who came down by the *Mariposa* assure me that the appearances there were identical with ours, and further that they were of frequent recurrence during the whole passage. We thus prove a continuous chain of these phenomena from New Zealand to California.

Permit me to call special attention to the very peculiar corona or halo extending from 20° to 30° from the sun, which has been visible every day with us, and all day, of whitish haze, with *pinkish* tint, shading off into *lilac* or purple against the blue. I have seen no notice of this corona observed elsewhere. It is hardly a conspicuous object.

The long continuance and extending diffusion of this haze or dry fog seems to justify expectation that it may become visible around the globe, and give ample opportunity for investigation.

Although not seen in San Francisco until November 23, it was brilliant in Santa Barbara on October 14. A rapid upper current seems to have borne it in a belt within the tropics in a very few days, leaving a slow diffusion to extend it to the temperate zone. Australia is perhaps an example of this.

I trust this letter may be a useful contribution towards a complete history of the diffusion of this very peculiar element around the globe. A good record of dates of earliest appearances might contribute something to our limited knowledge of currents in upper strata of the atmosphere.

Honolulu, December 14, 1883

SERENO E. BISHOP

[We have already referred to Mr. Bishop's letters in the Honolulu journal, but give here the following extract from his article in the *Hawaiian Annual*:—

"It now seems probable that the enormous projections of gaseous and other matter from Krakatoa have been borne by the upper currents and diffused throughout a belt of half the earth's circumference, and not improbably, as careful observation may yet establish, even entirely around the globe. This implies an amount of matter discharged that seems incredible. We learn, however, that the ocean was thickly and closely covered with floating pumice for hundreds of miles from the crater. A steamer 150 miles distant reports her barometer falling and rising half an inch every two or three minutes! This almost incredible statement implies a terrific undulation of the atmosphere, such as could only be produced by a vast and continuous jet of gas projected upwards beyond the limits of the atmosphere, and driving the air in vast waves in every direction. So abnormal and gigantic a force may well have propagated not only its tidal waves as it did across the Pacific, but it may also have transmitted its portentous and lurid vapours to belt the globe with flaming skies."]

FOR the last two months these appearances have in this province excited no small wonder and admiration, not unaccompanied in some cases with awe and dismal forebodings of impending calamity. As an example of what has been witnessed in greater or less intensity almost every morning and evening, about an hour before sunrise and after sunset, I may instance what was observed on the evening of the 29th and morning of the 30th ult. The ground from my residence rises towards the south and west, and the city of Fredericton lies towards the north-east, on a flat 100 feet lower, and at a distance of half a mile or more. On the evening in question, at an hour after sunset, the red glow in the sky was very conspicuous, and seemed to light up the whole heavens, so that the houses in the city were distinctly seen by the reflection from their sides, and the intervening snow appeared of an orange colour. It was bright enough to suggest the impression of a second sunset. Next morning at an hour before sunrise the deep red glow was equally decided.

W. BRYDNE-JACK

Fredericton, New Brunswick, January 3

IN response to your note in NATURE of December 13, 1883 (p. 157), I beg to inform you that the recent red sunsets have been especially observed by me on the following occasions:—

November 30, 1883, lasting until 5.30 p.m.; barometer at 1 o'clock 30.22 inches, at 9 p.m. 30.10 .

January 2, 1884, lasting until 7.30 p.m.; barometer at 1 p.m. 30.48 , at 9 p.m. 30.43 .

January 3, 1884; Barometer at 1 p.m. 30.30 , at 9 p.m. 30.23 .

On several other occasions the same phenomenon has been observed in a less degree.

AD. WENTZ'L, JUN.

Krasnicza Wola, Grodzisk, near Warsaw, January 11

THE "red glow" has again been very brilliant here on the evenings of January 9 and 10, as well as on the morning of January 10. On the following morning, January 11, the sky being likewise very clear, I confidently expected another display, but to my astonishment no trace of red did appear, the sun rising after an ordinary twilight of pale yellow. During the night a strong south wind had set in, which prevailed through the whole day, with extraordinary transparency of the air. In the evening clouds arose in the west, at first showing the red marginal colouring of ordinary sunsets, but later on there came again, distinctly higher than even the cirri, a very brilliant and lasting red luminosity.

It would be interesting to know whether at other places too the phenomena in question had been, as it were, suspended on the morning of January 11, in spite of a clear sky, or whether such a suspension had occurred on other days under similar meteorological circumstances.

D. WETTERHAN

Freiburg, Baden, January 12

THE last two days and nights here have been very fine with sunrises and sunsets as already described. This evening especially the colours were most brilliant, and did not fade away until at least an hour after sunset. It may interest those who are trying to account for this extraordinary appearance of the sky to know that here it has been followed by excessive rain and very bad weather. During December we had 9.57 against an average for the last twenty-two years of 4.46 inches. The greatest December rainfall registered at our Scutari Cemetery was 10.36 in 1862, the least being one inch in 1868. A printer's error makes me speak, in my letter of December 21, of a crescent moon "eighteen" days instead of 18 day old.

W. E. J.

Constantinople, January 11

Dust Atmosphere of China

IN the remarkable work on China by V. Richtofen, he gives (vol. i. p. 97) the following description of the *dust atmosphere* of the Loes country, China, which, it seems to me, bears upon the question of the influence of dust on the appearance of the sun and sky, the question now under discussion.

"All these, and other similar operating causes, give rise to that dust atmosphere (*Staubatmosphäre*) so characteristic of Central Asia, and still more particularly of the Loes District. Even during nearly complete calms the air is often for many days yellow and opaque. The view is completely hemmed in, and the sun appears merely as a dull bluish disk. More markedly is this character presented by these peculiar dust-storms so well known to travellers visiting Tien-tsin and Peking, and even more so to those who travel in the interior of the north-western provinces of China. The wind then blows from Central Asia; when it acquires motion, everything becomes coated with a fine, yellowish dust coating.

"In Shensi, where the atmosphere is but rarely clear and transparent, the whole landscape has a yellow tint; streets, houses, trees and crops, even the traveller one meets on the road, and the air itself, one and all are yellow-coloured."

He also cites Johnson's "Journey to Ilchi, the Capital of Kotan" (*R. Geogr. Soc.* xxxvii. 1867, p. 5), as bearing on this same character of those dry, dusty atmospheres.

Dublin, January 7

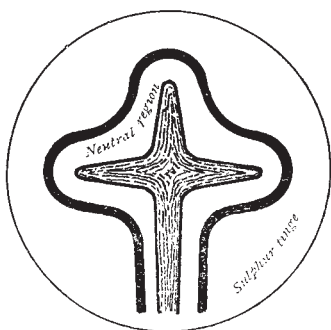
J. P. O'REILLY

Electric Shadows

ON reading Prof. Thompson's communication to NATURE of the 13th ult. (p. 156), giving the result of Prof. Righi's researches on the production of electric shadows in air at the ordinary pressure, I at once endeavoured to repeat the experiments with such simple means as were at hand. Two sticks of sealing-wax stuck to a small iron stand sufficed to support a long, big headed pin and the screen or object for casting the shadows. Instead of a plate of ebonite I used a cake of resin of six inches diameter, which serves ordinarily for the production of Lichtenberg's

figures; and from subsequent experiments it would seem that the resin serves the purpose *almost* as well as ebonite as far as clearness of definition is concerned. A metal plate, which may or may not be insulated, formed a base for the resin. I mention these details since the ebonite rods and plate are not so well within every one's reach, on the score of greater expense and the necessity of having them specially constructed for the experiments. A plate machine of some size (18-inch plate) seems necessary, as I find that, unless the Leyden jar is charged to rather high potential, no shadow is formed, and, further, that the sharp definition of the shadows increases with the charge of the jar. The screen used was a design, cut out in cardboard and tinfoil pasted over it, very similar in shape to that given in Fig. 2 in Prof. Thompson's paper, and the shadows obtained were substantially similar to that in Fig. 3. But here a small point not before recorded came out:—If the pin, from whose point the discharge is made to take place, be slanted in any direction, which is easily done with the sealing-wax holder by simply heating, the shadow of the object then lengthens out curiously, just as do the shadows formed by an object intercepting light rays as the obliquity of incidence is increased.

The new feature, however, which appeared from my experiments, and which is not recorded by Prof. Thompson, although very likely the experiment may have been done before, is as follows:—Instead of starting with the resin plate in a neutral condition, I gave it a rather strong negative charge by rubbing it vigorously with a fox's brush and discharging the Leyden jar as before on to the pin, using precisely the same object to cast the shadow as before. Its character now, however, was completely altered, appearing as I have endeavoured to represent it in the figure. A simple cross, having little resemblance as to outline



with the object, was the result. The red-lead of course was picked out by the negatively-charged resin under the object and piled up to form the cross, which was much more strongly red, as one would expect, than the former shadow. There was also a rather wide neutral region around the cross, considerably more than in the former experiments. It seems to me that this effect is something more than the attenuation of the shadow spoken of by Prof. Thompson, where the screen is electrified independently. Since the subject is one of considerable interest, perhaps it may be useful to show that any one having access to a fairly good electrical machine can repeat and possibly extend Prof. Righi's investigations.

W. F. SMITH

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Cosmic Dust

I FOUND in the *Nieuws van den Dag* of December 28, 1883, that a violet sand had been found in the dunes (probably near Scheveningen). The paragraph runs as follows:—When seen under the microscope (feeble magnifying) the ordinary yellow sand seemed to be composed for the greater part of almost white transparent grains, among which were a few light yellow, and pink, and single black grains. The violet sand, however, showed almost all the grains imbibed by a light violet tint, and moreover it contained a very great number of black glittering grains. An idea which occurred to me made me take up a small magnet, and on stirring with it in a glass full of the sand, the ends were covered by feathers formed by the black grains quite the same as the feathers which are formed on putting a magnet into filed dust. Probably I had there grains of a combination of iron; of the latter there was a great deal in it. Now this is the question: Are these grains of the same kind as those which the

naturalists have found and gathered on the snow-fields in the Polar regions, thus called cosmic dust?

Stuttgart, January

E. METZGER

Diffusion of Scientific Memoirs

I THINK it would promote scientific information if it were more the custom for those who need copies of papers to make direct application for them. Authors are usually provided with separate impressions for distribution, but are often much in the dark as to how to turn them to the best advantage. The bulk of such copies usually find their way to men of established scientific position who have worked at the subject of the paper in past years, but have perhaps ceased to take interest in it; while those who are actively engaged upon the subject, if they do not happen to have already published matter of importance, are left unprovided for.

I believe that most authors would willingly send copies of their memoirs to younger men, known to be engaged in scientific work, who should make application. But there is one rule which must be observed with the utmost stringency—otherwise I should feel that the evil of the present suggestion outweighs the good—viz. *the applicant must never expect a written answer.*

Cambridge

R.

Weather on Ben Nevis and Snowdon

I WAS much interested with the account of a visit paid to the Ben Nevis Observatory on December 26, 1883, described in *NATURE* of January 3 (p. 219), more particularly as the weather experienced on the summit was almost identical with that on Snowdon at the same time. I ascended Snowdon on December 23, 25, and 26 from the west, east, and north, and a neighbouring mountain, Glyder Fach, on the 24th. The views from the summit on the 25th and 26th can be best described by the following quotation from *NATURE* (p. 219), referring to Ben Nevis:—"The view from the summit was magnificent. All round there floated a billowy ocean of white mist" (extending from the slopes of the mountain to the horizon north, south, east, and west), "through which rose here and there black mountain peaks." "Overhead the sky was blue," and the sun shone brilliantly. The upper surface of the ocean of clouds was on the 25th about 2000 feet, and on the 26th 1000 feet, above sea-level.

On the 24th I ascended Glyder Fach through about 2500 feet of mist, and, to again quote from *NATURE* (p. 219), on reaching the ridge "suddenly emerged from the gloom of the mist into the brightest of daylight. Overhead the sky was blue, a fresh light breeze was blowing" from the north-west. I here noticed a curious phenomenon. I became suddenly aware, whilst standing in the sunlight on the ridge, that the air was full of an exceedingly minute dust driven by the wind from the north-west and descending at an angle of about 40°. The fall ceased quite suddenly one or two minutes after I noticed it. The impression left on my mind was that anything popularly spoken of as dust would be exceedingly coarse compared with it. There was no snow on the ground.

The phenomenon known under the name of the "Brocken Spectre," mentioned by Mr. Chrystal, may frequently be seen from the summit of Snowdon by any one not afraid of a little mist.

T. SINGTON

Kersal Moor, Manchester, January 7

Teaching Animals to Converse

J. S. B. seems to have misunderstood Sir John Lubbock's idea. It would be no great test if drawings were made, as the dog would see so little difference. Thus a dog of mine knows instantly whether he may go out with my housekeeper or not according to whether she wears her hat or her bonnet. In the first instance he knows she is going where he may go, and he is on his feet barking with joy as soon as she appears. If she has the bonnet on, he knows it to be church, or a visit to friends in the country, where he cannot go, and, like the "eldest oyster" (I quote from memory), he "winks his eye, and shakes his hoary head." If drawings of hat and bonnet were made, he would know them at once.

Some years since I had a remarkably clever Skye terrier, whose wisdom was at the time shown in a letter to the *Times*. This dog I taught as follows. When I went out it was quite sufficient to say "Yes" or "No" in an ordinary tone; but wanting to take him beyond that, I taught him very quickly to